

What is claimed is:

1. An objective lens unit for converging a light flux onto an information recording plane of an optical information recording medium in an optical pickup apparatus, comprising:

a first optical element arranged so as to be opposite to the optical information recording medium;

a second optical element arranged at a light source side of the first optical element so as to be opposite to the first optical element and including a ring-shaped structure in which plural ring-shaped zones are formed on at least one optical surface of the second optical element such that neighboring ring-shaped zones cause a predetermined optical path difference for incident rays; and

each of the first and second optical elements having an optical functional section and a flange section formed around the optical functional section, wherein the flange section of the first optical element and the flange section of the second optical element are formed so as to fix the first and second optical elements at predetermined respective relative positions.

2. The objective lens unit of claim 1, wherein each of the first and second optical elements is a plastic lens.

3. The objective lens unit of claim 1, wherein the following formula is satisfied:

$$|P2/P1| \leq 0.2$$

where P1 is a paraxial power ( $\text{mm}^{-1}$ ) of the first optical element and P2 is a paraxial power ( $\text{mm}^{-1}$ ) of the second optical element.

4. The objective lens unit of claim 1, wherein the neighboring ring-shaped zones are formed to displace relatively in an optical axis direction so as to cause the predetermined optical path difference.

5. The objective lens unit of claim 4, wherein the ring-shaped structure is a diffractive structure to diffract an incident ray.

6. The objective lens unit of claim 1, wherein the ring-shaped structure corrects a chromatic aberration caused by the first optical element.

7. The objective lens unit of claim 6, wherein a used wavelength is 500 nm or less.

8. The objective lens unit of claim 1, wherein the first optical element is a plastic lens and the ring-shaped structure corrects a spherical aberration caused by a change in refractive index of the first optical element.

9. The objective lens unit of claim 8, wherein an image side numerical aperture is 0.75 or more.

10. The objective lens unit of claim 1, wherein the objective lens unit is used to converge a light flux onto an information recording plane of plural different kind optical information recording mediums in which a thickness of a transparent substrate to protect an information recording plane of an information recording medium and a wavelength of a light flux used for recording and/or reproducing information are different from those of others, and wherein the ring-shaped structure corrects a spherical aberration due to a difference in thickness of a transparent substrate among the plural different kind optical information recording mediums and/or a spherical aberration due to a

difference in wavelength of a light flux used for recording and/or reproducing information for the plural different kind optical information recording mediums.

11. The objective lens unit of claim 1, wherein the following formula is satisfied:

$$0.8 \leq P1 \cdot T1 \leq 1.8$$

where  $P1$  is a paraxial power ( $\text{mm}^{-1}$ ) of the first optical element and  $T1$  is a thickness (mm) of the first optical element on the optical axis.

12. The objective lens unit of claim 1, wherein the first optical element is a refractive lens.

13. The objective lens unit of claim 1, wherein the ring-shaped structure is formed on an aspherical surface.

14. The objective lens unit of claim 1, wherein the flange section of the first optical element and the flange section of the second optical element are shaped to fit and come in contact with each other so that the first and second optical elements are fixed at the predetermined respective relative positions.

15. An optical pickup apparatus, comprising:  
the objective lens unit described in claim 1.
16. An optical information recording and/or reproducing apparatus, comprising:  
the optical pickup apparatus described in claim 15.